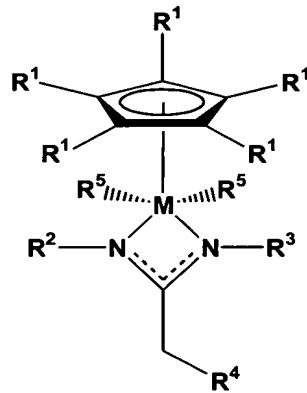


Amendments to the Claims

The listing of claims will replace all prior versions and listings of claims in the application.

Claim 1 (currently amended) An olefin polymerization catalyst comprising a pre-catalyst having the formula:



wherein M is Ti, Zr or Hf;

each R¹ is independently hydrogen or alkyl or two adjacent R¹ form an aryl group;

each R² and R³ is optionally substituted and is independently alkyl, cycloalkyl, SiX₃, or aryl; or

one R¹ and one of R² or R³ are taken together to form an alkyl, aryl, arylalkyl or alkylarylalkyl bridge;

R⁴ comprises alkyl, cycloalkyl, SiX₃, aryl, BR⁶₃ or a solid support;

each R⁵ is halo, optionally substituted alkyl, cycloalkyl, aryl, or arylalkyl;

R⁶ is optionally substituted phenyl;

B is the element boron; and

X is independently halo, alkyl, alkoxy or aryl.

Claim 2 (original) A catalyst composition comprising the olefin polymerization catalyst of claim 1 and a co-catalyst of the formula:

$[A]^{\oplus} [BR_4^6]^{\ominus}$ or BR_3^6

wherein A^{\oplus} is a cationic Lewis or Brønsted acid.

Claim 3 (original) The composition of claim 2, wherein said co-catalyst is $[PhNHMe_2][B(C_6F_5)_4]$.

Claim 4 (original) The catalyst of claim 1, wherein said solid support is an organic polymer or inorganic oxide.

Claim 5 (currently amended) The catalyst of claim 4, wherein said organic polymer is a polystyrene, polyamide, or polysaccharide.

Claim 6 (original) The catalyst of claim 4, wherein said inorganic oxide is a silica, alumina, titania, zirconia, or a combination thereof.

Claim 7 (original) The catalyst of claim 1, wherein said aryl is phenyl, naphthyl, indenyl, phenanthrenyl, anthracenyl, fluorenyl, or biphenyl.

Claim 8 (original) The catalyst of claim 1, wherein:

said optional substituents on alkyl are alkoxy, amide, aryl, alkyl, halo, ketone, ester, aldehyde, cyano and nitro; and

said optional substituents on aryl are alkoxy, amide, aryl, alkyl, halo, ketone, ester, aldehyde, cyano and nitro.

Claim 9 (original) The catalyst of claim 1, wherein M is Zr.

Claim 10 (original) The catalyst of claim 1, wherein each R^1 is hydrogen.

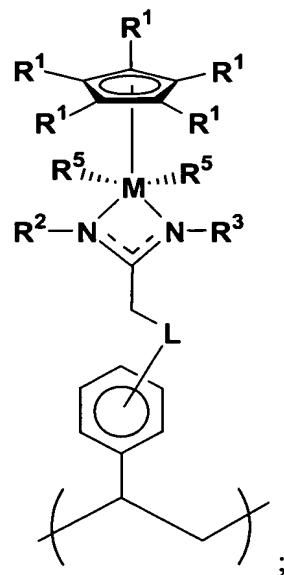
Claim 11 (original) The catalyst of claim 1, wherein each R^1 is methyl.

Claim 12 (original) The catalyst of claim 1 wherein said catalyst comprises about 0.1-10 mequiv/g of catalytic sites.

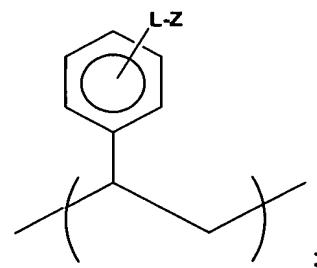
Claim 13 (original) The catalyst of claim 1, wherein said pre-catalyst is a copolymer having the formula:

poly[A-*co*-B];

wherein unit A has the formula:



unit B has the formula:



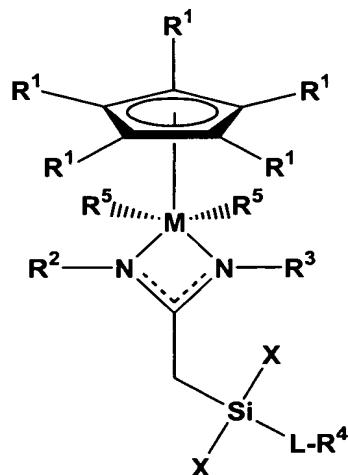
L is a linking group; and

Z is hydrogen, C₁₋₃ alkyl or C₁₋₃ alkoxy.

Claim 14 (original). The catalyst of claim 13, wherein L is sulfonyl, C₁₋₃ alkyl, C₁₋₃ alkoxy, carbonyl or does not exist.

Claim 15 (original). The catalyst of claim 13, wherein said unit A has a molar percentage in the range of about 50-80% and said unit B has a molar percentage in the range of about 20-50%.

Claim 16 (original). The catalyst of claim 1, wherein said pre-catalyst has the formula:



wherein L is a linking group.

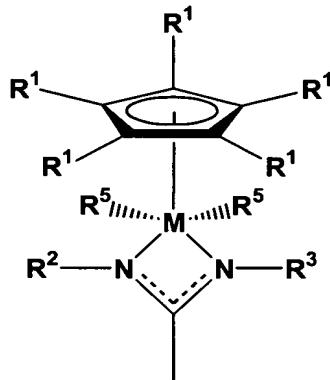
Claim 17 (original). The catalyst of claim 16, wherein L is amino, epoxy, thio, alkyl, alkoxy or aryl.

Claim 18 (original). The catalyst of claim 16 wherein R⁴ is an inorganic oxide and L is epoxy.

Claim 19 (original). The catalyst of claim 16, wherein said catalyst comprises about 0.1-10 mequiv/g of catalytic sites.

Claim 20. (original) A process for preparing an olefin polymerization catalyst, comprising:

(a) deprotonating a metal acetamidinate having the formula:



wherein M is Ti, Zr or Hf;

each R¹ is independently hydrogen or alkyl or two adjacent R¹ form an aryl group;

each R² and R³ is optionally substituted and is independently alkyl, cycloalkyl, SiX₃, or aryl; or

one R¹ and one of R² or R³ are taken together to form an alkyl, aryl, arylalkyl or alkylarylkyl bridge;

each R⁵ is halo, optionally substituted alkyl, cycloalkyl, aryl, or arylalkyl;

X is independently halo, alkyl, alkoxy or aryl;

to form an intermediate; and

(b) contacting said intermediate with an electrophile to form a precatalyst.

Claim 21. (original) The process of claim 20, further comprising:

(c) reacting said pre-catalyst with an activating co-catalyst.

Claim 22. (original) The process of claim 20, wherein said electrophile is electrophilic polystyrene.

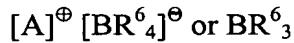
Claim 23. (original) The process of claim 20, wherein said electrophile is chloromethyl-substituted polystyrene, sulfonyl chloride-substituted polystyrene, $B(C_6F_5)_3$ or SiX_3 ; and X is independently halo, alkyl, alkoxy or aryl.

Claim 24. (original) The process of claim 20, further comprising after (b):

(d) reacting said precatalyst with an inorganic oxide solid support.

Claim 25. (original) The process of claim 20, wherein said inorganic oxide is a silica, alumina, titania, zirconia, or a combination thereof.

Claim 26. (original) The process of claim 21, wherein said co-catalyst has one of the formulae:



wherein A^\oplus is a cationic Lewis or Brønsted acid;

B is the element boron; and

R^6 is optionally substituted phenyl.

Claim 27. (original) The process of claim 26, wherein said co-catalyst is $[PhNHMe_2][B(C_6F_5)_4]$.

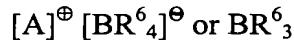
Claim 28. (original) The process of claim 20, wherein M is Zr.

Claim 29. (original) The process of claim 28, wherein each R^1 is methyl.

Claim 30 (original) A process for preparing a polyolefin, comprising:

reacting an olefin with an activated olefin polymerization catalyst composition, under conditions that result in the formation of a polyolefin;
wherein said catalyst composition comprises the pre-catalyst of claim 1.

Claim 31 (original) The process of claim 30, wherein said catalyst composition further comprises a co-catalyst having one of the formulae:



wherein A^{\oplus} is a cationic Lewis or Brønsted acid.

Claim 32 (original) The process of claim 31, wherein said co-catalyst is $[PhNHMe_2][B(C_6F_5)_4]$.

Claim 33 (original) The process of claim 30, wherein said olefin is ethene, propene, 1-butene, 1-pentene, 1-hexene, 1-heptene, 1-octene, styrene, alpha-methyl styrene, butadiene, isoprene, acrylonitrile, methyl acrylate, methyl methacrylate, vinyl acetate, vinyl chloride, vinyl fluoride, vinylidene chloride, N-vinyl pyrrolidone, 3-methylbutene, 3-methyl-1-pentene, vinylcyclohexene, vinylcyclobutane, vinylcyclopentane, vinylcyclooctane, 1-decene, enantiomerically pure β -citronellene, 3,5,5-trimethyl-1-hexene or 4-methyl-1-pentene.

Claim 34 (original) The process of claim 30, wherein said olefin comprises a mixture of two or more monomers having vinyl unsaturation.